Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the

application:

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Listing of Claims:

1. (Previously Cancelled)

10   2. (Previously Amended) The vision-based identification apparatus of claim **3**, wherein

the image capture device is a video camera responsive to electromagnetic radiation

substantially in at least one of the regions selected from the group consisting of the

visible region, and the infrared region.

15   3. (Previously Amended) A vision-based identification apparatus comprising:

a host vehicle;

wherein said host vehicle is equipped with a plurality of elements including:

    i)   an image capture device element; operatively interconnected with;

    ii)   an image signal processor element; which is operatively interconnected with;

20   iii)   a matching processor element; which is also operatively interconnected with;

    iv)   a radar transceiver element;

wherein the image capture device element is configured to provide a time-based sequence

of data frames to the image signal processor element and the image signal processor

element provides a processed image signal to the matching processor element, and

wherein the data frames include a two-dimensional array of pixel elements; and

5   wherein the radar transceiver element is configured to provide a radar signal to the

matching processor element, and

wherein the matching processor element combines the processed image signal and the

radar signal, whereby the combined signals complement each other and allow the

apparatus to effectively identify objects likely to be misidentified as collision threats,

10   wherein the time-based sequence of data frames include a plurality of data elements

including at least one horizontal edge; and

wherein each horizontal edge is identified based on a plurality of pixels having a

substantially similar electromagnetic radiation response across a plurality of substantially

horizontally aligned pixels; and

15   wherein the image signal processor element extracts horizontal edges, from the time-

based sequence of data frames, in the form of edge pixels, and

wherein the edge pixels are projected in each row of the data frames, to get a horizontal

edge projection in the sequence of data frames; and

wherein each horizontal edge projection may be tracked in time based on the horizontal

20   edge projection's sequential appearance in the data frames.

4. (Original) The vision-based identification apparatus of claim 3, wherein horizontal

edge projections may be tracked in time by recording sequential data frames and

matching horizontal edge projections in the sequential data frames while allowing, in the

sequential data frames, for minor variations from, in at least one of the following

categories:

    i.   the relative position of the horizontal edge projection in the frame;

5   ii.   the relative orientation of the horizontal edge projection in the frame; and

    iii.   the relative length of the horizontal edge projection; and

wherein at least one new tracking sequence can exist for horizontal edge projections that

have predefined characteristics but were not present in prior data frames.

10   5. (Original) The vision-based identification apparatus of claim **4**, wherein allowed,

minor variations in the sequential data frames provide data that allows for the

determination and recordation of distance traveled since the beginning of each horizontal

edge projection tracking sequence, and

wherein horizontal edge projection tracks are sorted based on at least one of the

15   following;

    i)   the duration of image inputs that the horizontal edge projection track records,

    ii)   the average length of the horizontal edge projection, and

    iii)   whether the horizontal edge projection track at current image frame is in an

        updating mode, a non-updating mode, or is a new horizontal edge projection.

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6. (Original) The vision-based identification apparatus of claim **4** wherein the horizontal

edge projection tracks are compared with predetermined parameters to determine if

tracking possibilities exist;

if tracking possibilities exist then the vision-based identification apparatus is utilized to

track substantially horizontal edges through successive image inputs.

7. (Original) The vision-based identification apparatus of claim **6** wherein the

5   predetermined parameters include at least one of the following;

    i.   the number of successive image inputs having horizontal edge projection

         tracks, and

    ii.   the magnitude of the horizontal edge projection tracks.

10   8. (Original) The vision-based identification apparatus of claim **4** wherein if no tracking

possibilities exist, tracking may still occur for a pre-specified number of image inputs

without tracking possibilities before the tracked horizontal edge projection track is

discarded.

15   9. (Previously Amended) The vision-based identification apparatus of claim 3 wherein

tracking of horizontal edge projection vectors is assisted by using at least one of the

following:

    i)   vertical motion compensation;

    ii)   forward motion compensation;

20   wherein vertical motion compensation helps predict where tracked horizontal edge

projection vectors will be located on successive image inputs by compensating for

vertical motion, and

wherein the forward motion compensation helps predict where tracked horizontal edge

projection vectors will be located on successive image inputs by compensating for

forward motion.

5   10. (Original) The vision-based identification apparatus of claim **9** wherein forward

motion compensation is achieved by using at least two previous points from the image

input on the tracked horizontal edge projection tracks, immediately before the image

input that requires forward motion compensation for tracked horizontal edge projection

vectors location prediction.

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11. (Original) The vision-based identification apparatus of claim **9** wherein vertical

motion is determined by:

    i.   extracting vertical slices of the image input; and

    ii.   extracting one dimensional optical flow profiles of relative intensity of the

15   vertical slices; and

    iii.   averaging the optical flow of all vertical slices.

12. (Original) The vision-based identification apparatus of claim **11** wherein the vertical

slices are extracted from each image input, and

20   the relative extreme negative intensities relate to a change from light to dark of an

apparent horizon.

13. (Original) The vision-based identification apparatus of claim **11** wherein the extreme

negative intensities' average variation between rows on successive image inputs is an

indicia of how an image collection device is moving vertically relative to at least one of

the following:

5   i.   an apparent horizon; and

    ii.   a distinct feature in the distance.

14. (Previously Amended) The vision-based identification apparatus of claim **3** wherein

the signal input from the image capture device to the image signal processor is a single

10   horizontally centered window of the image signal input from the image capture device.

15. (Original) The vision-based identification apparatus of claim **14** wherein the single   ·

horizontally centered window is set at a predetermined width and a predetermined height

and

15   wherein the single horizontally centered window can be adjusted either left or right based

on steering wheel position, or lane information.

16. (Original) The vision-based identification apparatus of claim **14** wherein successive

horizontal edge projection tracks have a length in excess of a predetermined length.

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17. (Original) The vision-based identification apparatus of claim **14** wherein if no

tracking possibilities exist, a tracking protocol will be allowed to remain in operation for

a pre-specified number of image inputs without tracking possibilities before the tracked

horizontal edge projection track is discarded.

18. (Previously Cancelled)

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19. (Previously Amended) A vision-based identification method as set forth in claim **20**,

wherein the image capture device element is a video camera responsive to

electromagnetic radiation substantially in at least one of the regions selected from the

group consisting of the visible region, and the infrared region.

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20. (Previously Amended) A vision-based identification method comprising the steps of:

providing a host vehicle; and

equipping the host vehicle with a plurality of elements including:

    i)   an image capture device element; operatively interconnected with;

15   ii)   an image signal processor element; which is operatively interconnected with;

    iii)   a matching processor element; which is also operatively interconnected with;

    iv)   a radar transceiver element;

wherein the image capture device element is configured to provide a time-based sequence

of data frames to the image signal processor element and the image signal processor

20   element provides a processed image signal to the matching processor element; and

wherein the data frames include a two dimensional array of pixel elements; and

wherein the radar transceiver element is configured to provide a radar signal to the

matching processor element; and

wherein the matching processor element combines the processed image signal and the

radar signal, whereby the combined signals complement each other and allow for the

effective identification of objects likely to be misidentified as collision threats, wherein

the time-based sequence of data frames include a plurality of data elements including at

5   least one horizontal edge; and

wherein each horizontal edge is identified based on a plurality of pixels having a

substantially similar electromagnetic radiation response across a plurality of substantially

horizontally aligned pixels; and

wherein the image signal processor element extracts horizontal edges, from the time-

10   based sequence of data frames, in the form of edge pixels; and

wherein the edge pixels are projected in each row of the data frames, to get a horizontal

edge projection in the sequence of data frames; and

wherein each horizontal edge projection may be tracked in time based on the horizontal

edge projection's sequential appearance in the data frames.

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21. (Original) A vision-based identification method as set forth in claim **20**, wherein

horizontal edge projections may be tracked in time by recording sequential data frames

and matching horizontal edge projections in the sequential data frames while allowing, in

the sequential data frames, for minor variations from, in at least one of the following

20   categories:

        i. the relative position of the horizontal edge projection in the frame;

        ii. the relative orientation of the horizontal edge projection in the frame; and

        iii. the relative length of the horizontal edge projection; and

wherein at least one new tracking sequence can exist for horizontal edge projections that

have predefined characteristics but were not present in prior data frames.

22. (Original) A vision-based identification method as set forth claim **21**, wherein

5   allowed, minor variations in the sequential data frames provide data that allows for the

determination and recordation of distance traveled since the beginning of each horizontal

edge projection tracking sequence, and

wherein horizontal edge projection tracks are sorted based on at least one of the

following;

10   i. the duration of image inputs that the horizontal edge projection track records;

ii. the average length of the horizontal edge projection; and

iii. whether the horizontal edge projection track at current image frame is in an

updating mode, a non-updating mode, or is a new horizontal edge projection.

15   23. (Original) A vision-based identification method as set forth in claim **21** wherein the

horizontal edge projection tracks are compared with predetermined parameters to

determine if tracking possibilities exist;

if tracking possibilities exist then the vision-based identification apparatus is utilized to

track substantially horizontal edges through successive image inputs.

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24. (Original) A vision-based identification method as set forth in claim **23** wherein the

predetermined parameters include at least one of the following;

i. the number of successive image inputs having horizontal edge projection tracks;

and

ii. the magnitude of the horizontal edge projection tracks.

5   25. (Original) A vision-based identification method as set forth in claim **21** wherein if no

tracking possibilities exist, tracking may still occur for a pre-specified number of image

inputs without tracking possibilities before the tracked horizontal edge projection track is

discarded.

10   26. (Previously Amended) The vision-based identification method of claim 20 wherein

tracking of horizontal edge projection vectors is assisted by using at least one of the

following:

   i)   vertical motion compensation; and

   ii)   forward motion compensation;

15   wherein vertical motion compensation helps predict where tracked horizontal edge

projection vectors will be located on successive image inputs by compensating for

vertical motion, and

wherein the forward motion compensation helps predict where tracked horizontal edge

projection vectors will be located on successive image inputs by compensating for

20   forward motion.

27. (Original) The vision-based identification method of claim **26**, wherein forward

motion compensation is achieved by using at least two previous points from at the image

input on the tracked horizontal edge projection tracks, immediately before the image

input that requires forward motion compensation for tracked horizontal edge projection

vectors location prediction.

5   28. (Original) A vision-based identification method as set forth in claim **26**, wherein

vertical motion is determined by:

      i.   extracting vertical slices of the image input; and

      ii. extracting one dimensional optical flow profiles of relative intensity of the

           vertical slices; and

10   iii. averaging the optical flow of all vertical slices.

29. (Original) A vision-based identification method as set forth in claim **28**, wherein the

vertical slices are extracted from each image input, and

the relative extreme negative intensities relate to a change from an electromagnetic

15   radiation emission region having a greater intensity to an electromagnetic radiation

emission region of lower intensity of an apparent horizon.

30. (Original) A vision-based identification method as set forth in claim **28**, wherein the

extreme negative intensities' average variation between rows on successive image inputs

20   is an indicia of how an image collection device is moving vertically relative to at least

one of the following:

      i. an apparent horizon; and

      ii. a distinct feature in the distance.

31. (Previously Amended) A vision-based identification method as set forth in claim 20, wherein the signal input from the image capture device to the image signal processor is a single horizontally centered window of the image signal input from the image capture

5   device.

32. (Original) A vision-based identification method as set forth in claim **31**, wherein the single horizontally centered window is set at a predetermined width and a predetermined height; and

10   wherein the single horizontally centered window can be adjusted either left or right based on steering wheel position, or lane information.

33. (Original) A vision-based identification method as set forth in claim **31**, wherein successive horizontal edge projection tracks have a length in excess of a predetermined

15   length.

34. (Original) A vision-based identification method as set forth in claim **31** wherein if no tracking possibilities exist, a tracking protocol will be allowed to remain in operation for a pre-specified number of image inputs without tracking possibilities before the tracked

20   horizontal edge projection track is discarded.

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

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39. (Cancelled)

40. (Cancelled)

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41. (Cancelled)

42. (Cancelled)

15　43. (Cancelled)

44. (Cancelled)